

BASELINE NUTRIENT MANAGEMENT PLAN

(Meets Requirements of USDA-NRCS Programs and Minnesota State 7020 Feedlot Rules)



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The Baseline Nutrient Management Plan includes information on:

- ✓ Livestock, annual manure production, manure storage, and manure nutrients available for spreading.
- ✓ Available cropland acres and acres needed for manure application (minimum acres calculation)
- ✓ Recommended field specific soil and water conservation practices
- ✓ Sensitive area management
- ✓ Operation and maintenance
- ✓ Field maps, soils maps, and soils map legend
- ✓ Soils information, including soil test results

I. LIVESTOCK; MANURE STORAGE, HANDLING AND TESTING; AND TOTAL NUTRIENTS FROM LIVESTOCK

The attached “**Manure Storage, Handling and Testing**” report contains information about the type of livestock; the quantity of manure produced annually by those livestock; your current or planned storage systems; and your manure testing practices, spreader calibration procedures and application methods. Manure quantity, if estimated, does not include bedding, wash-water or lot runoff water. The attached “**Manure Nutrient Supply**” report indicates total nutrients available to plants in the year of application from a year’s supply of manure after deducting nutrient losses in storage and during application.

II. AVAILABLE CROPLAND ACRES AND ACRES NEEDED FOR MANURE APPLICATION

Crop production sequence and cropland acres available for manure application are shown on the attached “**Crop Nutrient Demand**” report. Minimum crop acres needed to utilize manure are shown on the attached “**Nutrient Summary**” report. The total crop nutrient demand is based on a rotational average after deducting nutrients supplied by the soil and previous legumes. The crop acres needed to utilize manure are a comparison of total manure nutrient production from livestock and storage facilities, after storage and application losses, with total crop nutrient demand from the rotation.

The rotational average calculations for the “**Crop Nutrient Demand**” and “**Nutrient Summary**” reports assume application of manure to both legumes (soybeans in this example plan) and non-legumes (corn in this example). This is generally not a preferred practice, but is used to determine the minimum acres needed to meet state feedlot rules for the operation. Efficient use of nitrogen and prevention of phosphorus buildup in the soil would usually emphasize application of manure to non-legumes in the rotation. The “**Annual Crop Nutrient Plan**” section contains the actual field specific manure and fertilizer nutrient rates to be applied.

III. SOIL AND WATER CONSERVATION PRACTICES AND MANURE APPLICATIONS

Your field specific manure application recommendations have considered proximity to sensitive features and inherent erosion and runoff potentials. No manure applications are recommended on fields with greater than 6 tons/acre/year sheet and rill soil losses. The following soil and water conservation practices have been or should be implemented to reduce erosion and runoff potential on fields receiving manure applications.

<input checked="" type="checkbox"/> Mulch tillage	Fields: 1,4,7,South 36, North 40, South 40
<input type="checkbox"/> Contouring	Fields:
<input type="checkbox"/> Contour Strip-Cropping	Fields:
<input type="checkbox"/> Grass/hay in rotation	Fields:
<input type="checkbox"/> Terraces	Fields:
<input checked="" type="checkbox"/> Filter Strips	Fields: 2,4
<input type="checkbox"/>	Fields:

Consult your **Soil and Water Conservation Plan** for additional detail.

IV. FIELDS WITH SENSITIVE AREAS REQUIRING SPECIAL MANAGEMENT

Your fields may contain features that require special management in addition to implementation of soil and water conservation practices. These features increase the potential for pathogenic organisms or applied nitrogen and phosphorous to move towards ground water or surface waters. Elevated levels of nitrogen in drinking water can cause illness or even death in babies and young livestock. Scientific trials show direct relationships between soil test phosphorus (STP) levels and soluble algal available phosphorous in runoff. The higher the soil phosphorous levels, the greater the possibility of accelerating algae growth if that runoff reaches surface waters. Additionally, it takes many years to reduce STP levels once they have climbed to extremely high levels.

Sensitive Areas

Sensitive areas are areas where natural factors increase the potential for degradation of natural resources including water quality. The potential for degradation can be minimized or eliminated by understanding and accounting for these factors when planning nutrient applications.

Your field-specific sensitive features and management practices to use on them are listed on the following reports. Additional general reports on nutrient application restrictions or recommended management practices may have been included in this plan for informational purposes. (“√” signifies required plan information)

- √ **Maps showing the location of sensitive areas**
- √ **“Management Practice Considerations for Sensitive Fields” report**
- ☐ **“Nutrient Application Restrictions in Sensitive Areas” report**
- ☐ **“Management Practice Considerations for Nitrogen and Phosphorus” report**
- ☐

Applications within Vulnerable Public Drinking Water Supply Management Areas

Fields receiving manure or commercial nitrogen fertilizer **are not** located within a public drinking water supply management area that has been classified as vulnerable to contamination. As a result, the “**Management Practice Considerations for Nitrogen and Phosphorus**” report **has not** been included to provide nitrogen management practice recommendations for those vulnerable areas.

Winter-time Manure Applications

Fields included in this plan **will not** be receiving wintertime manure applications to frozen, or snow-covered surfaces and **are not** identified on the attached aerial photos or maps. It is recommended that manure applications during the winter months be made to the flattest fields that are the furthest distance from surface water. Do not apply manure on actively thawing surfaces. Do not apply solid manure on fields with greater than 4 tons/acre/year soil losses. Do not apply liquid manure applications on fields with greater than 2 tons/acre/year soil losses. Soil and water conservation practices needed to keep soil losses at 2-4 tons/acre/year have been listed in “Section V” of this plan.

Summer-time Manure Applications

Fields included in this plan **will not** be receiving manure applications during June, July or August that are either fallow or the crop has been harvested. The fields **are not** identified on the attached aerial photos or maps. Fields receiving manure applications in the summer must have a crop actively growing or a cover crop must be established following early harvested crops. The following cover crops will be established on fields receiving summer-time manure applications: None

Nitrogen and Phosphorous Loss

The general sensitivity of the farm to nitrogen transport has been determined based on soil texture in your fields and annual rainfall amounts. Additional factors used in this evaluation include: (None). Based on this evaluation, nitrogen transport and loss potentials are **Medium**. Field specific loss ratings can be found on the attached “**Field Nitrogen Loss Assessment**” report.

The general sensitivity of the farm to phosphorus transport has been determined based on current soil test P levels and soil loss levels and distance to receiving waters. Additional factors used in this evaluation include: (None). Based on this evaluation, phosphorous transport and loss potentials are Medium to High. Field specific loss ratings can be found on the attached “**Field Phosphorous Loss Assessment**” report.

High Soil Phosphorous Levels

Your field specific plans and sensitive area practices have considered soil test phosphorous (STP) levels. You should manage your operation to avoid excessive build-up of STP. Manure applications may not have been recommended on some fields because of very high STP levels. Additional recommendations include:

- Maintain a STP level of approximately 21 ppm (42 lbs./ac) Bray P1. This will almost always provide crops with enough phosphorous.
- Plan the rate and frequency of manure applications to avoid STP buildup to 75 ppm as Bray P1. Cease applications before STP levels reach 150 ppm (300 lbs./ac.) as Bray P1.
- The following manure application frequencies should be implemented as a phosphorus strategy for either building or maintaining or reducing STP levels.

Manure Application Frequency	List of Fields
Application every four years	4
Application every two years	1,2, recommended for all other fields

- If STP levels continue to rise, two final options are available: 1.) find additional acres for manure applications and/or 2.) change rations to reduce the amount of nutrients excreted by livestock. At your request “**Livestock Ration Self-Assessment**” worksheets” providing options for reducing excreted N and P **have not** been included in this plan.

V. DEAD ANIMAL DISPOSAL

Disposal of dead animals or animal parts is an important consideration in comprehensive nutrient management. At your request the report “**Animal Carcass Disposal Best Management Practices**” **has not** been included in this plan. Also at your request “**Animal Mortality Worksheets**” for estimating your mortalities **have not** been included in this plan.

Mortality disposal system:

- a. Mortalities average n.a. per year.
- b. Mortalities are disposed of by n.a..

VI. OPERATION AND MAINTENANCE

1.) Operation

- The Operation and Maintenance plan for your system's manure storage, treatment, and transfer components should be carefully read, particularly concerning toxic gasses and fumes in confined locations; required fencing around ponds and periodic inspections of system components.
- The storage structure(s) should be emptied as shown below and as appropriate should be properly agitated prior to pumping to dislodge settled solids from the bottom and insure adequate nutrient mixing.
- Soils should be sampled for organic matter, pH, phosphorus and potassium on each field at least once every 4 years. Testing for residual soil nitrate should be done annually where appropriate. Sampling and testing for soil nitrate **are not** being planned as a crop N use strategy for this operation. Soil samples will be collected and handled according to Univ. of Minn. or NRCS guidelines (USDA-NRCS-MN Fact Sheet MN-NUTR3 Soil Sampling) and analyzed by a Minnesota Department of Agriculture (MDA) certified laboratory.
- Manure should be tested initially once per year for at least 3 years. Testing frequency can be reduced if analyses show consistent results overtime or between pump-out or scraping periods. Always retest following changes in manure storage and handling, livestock types or livestock feed. Your planned manure testing frequencies are listed in the table below. Manure samples will be collected and handled according to Univ. of Minn. guidelines (UMES bulletin FO-6423-GO Livestock Manure Sampling) and analyzed by a Minnesota Department of Agriculture (MDA) certified laboratory.

	Storage Facility	Number of Times and planned months to Empty Per Year	Manure Sampling Frequency	Man hours required to empty facility
1	Building 1- underground liquid	2(Apr. and Nov.)	Semi-annually	50 hours annually
2	Building 2-underground liquid	1 (Apr)	Annually	40 hours annually
3				

- Commercial fertilizer and manure application equipment will be maintained and calibrated according to manufacturer directions and MN. Dept. of Agriculture and Univ. of Minn. guidelines (MDA Fact Sheet **Maintaining Anhydrous Ammonia Equipment** and UMES fact sheet **Calibrating Manure Spreaders**). Equipment will be maintained to insure that applied rates do not deviate from planned rates by more than approximately 15%.
- Manure will be applied in a uniform pattern that delivers the specified amount across the entirety of the planned area. Application method and incorporation timing will also be uniform across the planning area.
- Safety practices will be utilized to minimize exposure to manure gases and organic wastes and chemical fertilizers-particularly ammonia forms of fertilizers (MN. Dept. of Ag. Fact Sheets **Minnesota Ammonia Rules Revised** and **Anhydrous Ammonia Quick Checklist'**). Protective clothing including footwear, a respirator, and gloves will be worn when appropriate.
- Fertilizer storage areas will be protected from weather to minimize runoff, leakage, and loss of material.

- An **emergency response plan** will be prepared as a contingency for a storage facility spill, leak or failure or in the event of spill while transporting or applying manure to your fields. At your request forms used to develop an emergency response plan **have not** been attached to this plan.
- Consider identifying fields (areas) for emergency wintertime or growing-season manure applications.

2.) Maintenance

Maintain application equipment in good operating condition and clean after nutrient applications.

3.) Record keeping.-Maintain for a six-year period

Farm specific records

- Quantity of manure and other organic by-products produced.
- Dates and amount of manure removed from the system due to feeding, energy production, or export from the operation.
- Carcass disposal techniques
- Quantity and location of manure transported off-site to land not owned or controlled by you.

Field specific records

- Name and address of commercial hauler or applicator receiving manure.
 - Crop yields, planting and harvest dates and crop residues removed.
 - Type of nutrient applied to each field (commercial fertilizer, manure, other nutrient source) and analysis of the nutrient.
 - Application dates and rates, including application methods and time to incorporation.
- At your request record keeping forms **have not** been included in this plan.

4.) Plan Review

This baseline plan should be reviewed annually and updated as necessary.

VII. ANNUAL CROP NUTRIENT MANAGEMENT PLAN

Your attached annual **Crop Nutrient Management Plan** contains field specific recommendations for manure and fertilizer application methods, timing and rates. The application timing and incorporation recommendations take into consideration potential for loss of nitrogen and/or phosphorus to air, runoff and leaching. The rate recommendations are based on realistic yield goals, soil tests, manure analyses and University of Minnesota fertilizer guidelines.

The rate recommendations are not valid if any of the following occur. 1.) Manure is not regularly sampled and analyzed. 2.) Application equipment is not regularly calibrated for the recommended rates. 3.) More manure is applied in one part of a target area than in another part even though the same rate is recommended for the entire area (application rate and method is not uniform)

This plan was developed based on USDA-Natural Resources Conservation Service of Minnesota standards and any applicable federal or state regulation in place as of the date shown below. Additional practices may be necessary to comply with local regulations. This plan was developed based on the current crop and animal production practices of the farm operation. Changes in those production practices could result in the need for modifying and updating of this plan.

Planner signature

Date

Planner Name

Title / Occupation

Street Address

Phone Number

City / State / Zip Code

CCA # or other certification